Poster Code: SA40

A Comparison of EHR and Claims-based Cohort Definitions on Real-World Research Results for Atherosclerotic Cardiovascular Disease (ASCVD)

Scan for poster + more

Michael Buck PhD,[1] Michael Wong BEng,[2] Jared Kamauu BFA,[1] Aaron Kamauu MD MS MPH[1]

[1]Navidence Inc., USA; [2]OneMedNet, USA

So What?

Across overlapping OneMedNet Billing and Clinical Codes from the EHR data, 5 published ASCVD definitions again produced markedly different cohorts — only 30–37% of patients met all 5 — reproducing our prior finding that *which* codes are included matters more than *how many*. **Publish complete code lists and select CODefs with data.**

BACKGROUND

Context

In real-world research (RWR), complex clinical concepts like atherosclerotic cardiovascular disease (ASCVD) are defined by combining multiple composite medical conditions into cohort phenotypes. Consistent conceptual and computable operational definitions (CODefs) are essential for meaningful, reproducible results.

The Gap / Problem

Our prior study (ISPOR US 2026, poster PT7) found that cohort membership depends more on including the right specific codes than on maximizing code count. Whether this holds when billing and clinical data are drawn from the same nationwide patient network had not been tested.

HEOR / RWE Relevance

FDA guidance (2023) states that "small differences in the choice of operational definition … may have a large impact on study results." Validating definition behavior across data types (billing vs. clinical) tests whether that impact is reproducible.

OBJECTIVES

Primary Objective

To pragmatically validate prior findings by replicating five published ASCVD cohort definitions in overlapping OneMedNet billing and clinical data and comparing the resulting patient cohorts.

Secondary Objectives

- Compare cohort sizes and exclusive cohort intersections between billing and clinical sources
- Quantify patients identified by only one data source
- Assess consistency with the prior claims-based ISPOR 2026 study

LIMITATIONS

- Analysis limited to OneMedNet billing and clinical data; results may vary in other data sources.
- Membership reflects presence of published ICD-10-CM codes only; differences in billing vs. clinical documentation practices affect capture.

ACKNOWLEDGMENTS & FUNDING

Real-world billing and clinical data were provided by OneMedNet (Eden Prairie, MN, USA).

REFERENCES

1. FDA. Use of Real-World Evidence to Support Regulatory Decision-Making for Medical Devices. 2023.
2. Kamauu A, et al. Impact of Variance in Cohort Phenotype Definitions on Real-World Research: An Assessment of ASCVD Definitions on Real-World Data. ISPOR 2026; Poster PT7.
3. Mackinnon ES, et al. Increasing Prevalence and Incidence of ASCVD in Adult Patients in Ontario, Canada. CJC Open. 2021;4(2):206-213.
4. Dai D, et al. Multimorbidity in ASCVD and Its Associations With Adverse CV Events and Healthcare Costs. J Health Econ Outcomes Res. 2024;11(1):75-85.
5. Sajja A, et al. A simplified approach to identification of risk status in patients with ASCVD. Am J Prev Cardiol. 2021;7:100187.
6. Barrios V, et al. Treatment patterns and use of healthcare resources of patients with ASCVD. Front Cardiovasc Med. 2022;9:966049.
7. Mackinnon ES, et al. Real-World Risk of Recurrent CV Events in ASCVD Patients. Cardiol Ther. 2024;13(1):205-220.
8. Kamauu J, et al. Defining ASCVD in RWR: An Analysis of Conceptual and Operational Definition Variability. ISPOR 2026; Poster MSR49.

METHODS

Study Design & Data Source

Cross-sectional cohort replication study. Five published ASCVD definitions with complete ICD-10-CM code lists, identified through a targeted literature review, were replicated in OneMedNet data: two overlapping US nationwide sources — billing and clinical records — for the same patients.

Study Population

All patients meeting ≥1 definition in either source (N = 237,983). Membership in each definition was assessed independently in billing (n = 217,901) and clinical (n = 142,313) data; 122,231 patients qualified in both.

Figure 1: ***Literature Review → Cohort Definition Replication***



Table 1: ASCVD Cohort Definitions

Def.	Source Study	Conditions	ICD-10-CM Codes
C1	Mackinnon 2021	10	267
C2	Dai 2024	10	627
C3	Sajja 2021	13	637
C4	Barrios 2022	8	544
C5	Mackinnon 2024	3	202

Statistical Analysis

Each patient was assigned to each definition independently in billing and clinical data. Exclusive cohort intersections (each patient counted once in the exact combination of definitions met) were tabulated and visualized as UpSet plots, and billing vs. Clinical agreement was assessed per definition. Results were compared descriptively with the prior study.

Computable Operational Definitions (CODefs™)

Study elements — exposures, outcomes, and covariates — were defined using Navidence CODefs™: rigorous, data source-agnostic algorithms that ensure precision and reproducibility across real-world data sources.

navidence.com

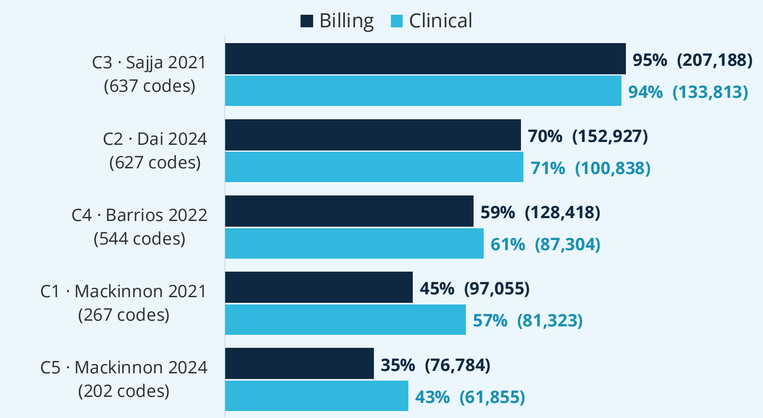
TRANSPARENCY & REPRODUCIBILITY

Definitions were replicated exactly from the ICD-10-CM code lists published in the source studies (refs 3–7) and implemented as Navidence CODefs™. The study applied the same methodology as the prior ISPOR 2026 study (ref 2) to enable direct comparison across data sources.

RESULTS

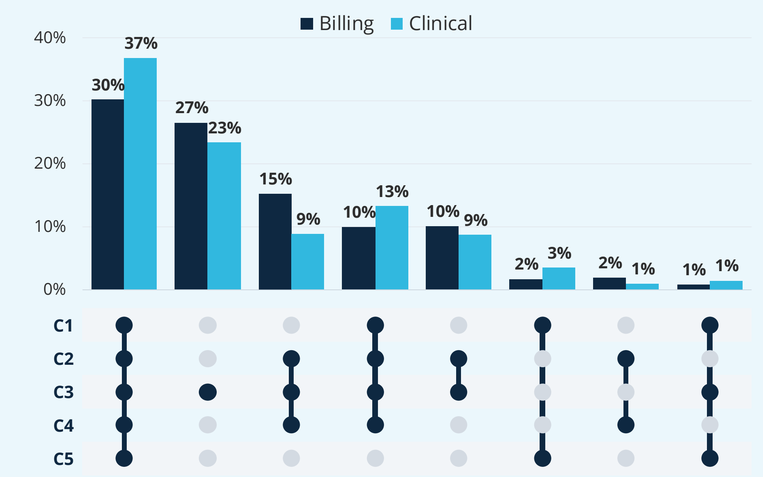
237,983	218K | 142K	30–37%
Patients Meeting ≥1 ASCVD Definition	Billing | Clinical Qualifying Patients	Patients Common to All 5 Definitions

Figure 2: ***Patients per ASCVD Cohort Definition, Billing vs. Clinical (% of source patients)***



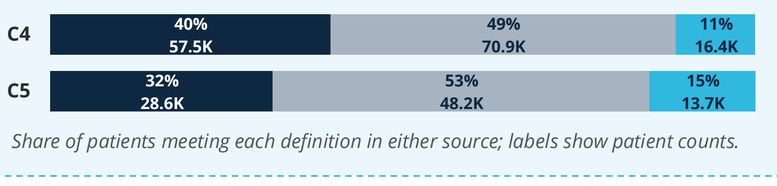
Denominators: billing n = 217,901; clinical n = 142,313 (patients meeting ≥1 definition in each source).

Figure 3: ***Top 8 Exclusive Cohort Intersections (UpSet), Billing vs. Clinical***



Each column is one exact combination of definitions (dots); bars show % of source patients in that combination.

Figure 4: ***Billing vs. Clinical Agreement by Cohort Definition***



Share of patients meeting each definition in either source; labels show patient counts.

CONCLUSIONS

Key Findings

- Cohort size varied 2.7× by definition in billing (76,784–207,188) and 2.2× in Clinical (61,855–133,813); C3 captured ≥94% of each source while C5 captured 35–43%.
- Only 30% (billing) and 37% (clinical) of patients met all 5 definitions; the top 3 intersections held 72–73% of patients — consistent with the prior study (~70%).
- Which codes matter more than how many: C3 (637 codes) captured 95% of billing patients vs. 70% for C2 (627 codes) — 10 fewer codes, 25 points fewer patients.
- Billing identified 95,670 patients not found in Clinical (Clinical: 20,082 not in Billing). Clinical's top 3 differed only by C1, which captured more retinal artery occlusions (H34.1x, H34.2x).

Clinical & Policy Implications

Definition choice — not code count — consistently shapes cohorts across billing and clinical data. Publish complete code lists and select CODefs using data from the intended source.

Contact: michael.buck@navidence.com